IGCSE Edexcel equations you need to be familiar with

Section 1

Diffusion of gases: formation of ammonium chloride from ammonia and hydrogen chloride gas	$HCl\ (g) + NH_3\ (g) \longrightarrow NH_4Cl\ (s)$
Electrolysis of molten lead bromide	$PbBr_2\ (l) \longrightarrow Pb\ (s) + Br_2\ (l)$
Electrolysis of concentrated sodium chloride solution (=brine)	$2H^+(aq) + 2Cl^-\ (aq) \longrightarrow Cl_2\ (g) + H_2\ (g)$
Electrolysis of dilute sulphuric acid	$4OH^-\ (aq) + 4H^+\ (aq) \rightarrow O_2\ (g) + 2H_2O\ (l) + 2H_2\ (g)$

Section 2

Alkali metals in water	$2Na\ (s) + 2H_2O\ (g) \longrightarrow 2NaOH\ (aq) + H_2\ (g)$ You can replace Na in the equation above with Li, K, Rb or even Cs.
Displacement of chloride ions by fluorine	$F_2\ (aq) + 2NaCl\ (aq) \rightarrow Cl_2\ (aq) + 2NaF\ (aq)$ You can replace Cl by Br or I (iodine).
Displacement of bromide ions by chlorine	$Cl_2\ (aq) + 2NaBr\ (aq) \rightarrow Br_2\ (aq) + 2NaCl\ (aq)$ You can replace Br by I (iodine).
Displacement of iodide ions by bromine	$Br_2\ (aq) + 2NaI\ (aq) \rightarrow I_2\ (aq) + 2NaBr(aq)$
Oxidation of copper	$2Cu\ (s) + O_2\ (g) \longrightarrow 2CuO\ (s)$
Laboratory preparation of oxygen using hydrogen peroxide and manganese dioxide as catalyst	$2H_2O_2\ (l) \rightarrow 2H_2O\ (l) + O_2\ (g)$
Burning of magnesium	$2Mg\ (s) + O_2\ (g) \rightarrow 2MgO\ (s)$
Burning of carbon	$C\ (s) + O_2\ (g) \rightarrow CO_2\ (s)$
Oxidation of sulphur	$S\ (s) + O_2\ (g) \rightarrow SO_2\ (g)$
Preparation of carbon dioxide using an acid and a metal carbonate	$CaCO_3\ (s) + 2HCl\ (aq) \rightarrow CaCl_2\ (aq) + 2H_2O\ (l) + CO_2\ (g)$
Combustion of hydrogen	$2H_2\ (g) + O_2\ (g) \rightarrow 2H_2O\ (l)$
Testing for water/hydration of anhydrous copper sulphate	$CuSO_4\ (s) + 5\ H_2O\ (l) \rightarrow CuSO_4.5H_2O$
Magnesium and hydrochloric acid to produce hydrogen	$Mg\ (s) + 2HCl\ (aq) \rightarrow MgCl_2\ (aq) + H_2\ (g)$ Replace magnesium by any other group 2 metal or Cu or Zn
Some displacement reactions involving metals and metal salt solutions	$Mg\ (s) + CuSO_4\ (aq) \rightarrow MgSO_4\ (aq) + Cu\ (s)$ $Fe\ (s) + CuSO_4\ (aq) \rightarrow FeSO_4\ (aq) + Cu\ (s)$
Testing for sulphate ion to form a white precipitate (s) (this is also an equation for the preparation of an insoluble salt)	$CuSO_4\ (aq) + Ba(NO_3)_2\ (aq) \rightarrow Cu(NO_3)_2\ (aq) + BaSO_4\ (s)$
Testing for chloride ion to form a white precipitate (s) (this is also an equation for the preparation of an insoluble salt)	$CuCl_2\ (aq) + 2AgNO_3\ (aq) \rightarrow Cu(NO_3)_2\ (aq) + 2AgCl\ (s)$
Thermal decomposition of a metal carbonate	$CuCO_3\ (s) \rightarrow CuO\ (s) + CO_2\ (g)$

Section 3

Complete combustion of methane	$CH_4 + 2O_2 \longrightarrow CO_2 + 2H_2O$
Incomplete combustion of methane	$2CH_4 + 3O_2 \longrightarrow 2CO + 4H_2O$
Methane reacting with chlorine in UV (substitution)	$CH_4 + Cl_2 \longrightarrow CH_3Cl + HCl$
Ethene reacting with bromine (=addition)	$C_2H_4 + Br_2 \longrightarrow C_2H_4Br_2$
Hydration of ethane to form ethanol	$C_2H_4 + H_2O \longrightarrow C_2H_5OH$
Fermentation	$C_6H_{12}O_6$ (aq) $\longrightarrow 2C_2H_5OH$ (aq) $+ 2CO_2$ (g)

Section 4

Acid reacting with a metal to form hydrogen and a salt	H_2SO_4 (aq) + Mg (s) $\longrightarrow MgSO_4$ (aq) + H_2 (g) Mg can be replaced by Zn, Cu or a group 2 metal
Acid reacting with a metal oxide to produce a salt and water	2HCl (aq) + MgO (s) $\longrightarrow MgCl_2$ (aq) + H_2O (l)
Acid reacting with a metal hydroxide to form a salt and water	HCl (aq) + NaOH (aq) $\longrightarrow$ NaCl (aq) + H_2O (l)
Acid reacting with a metal carbonate to form a salt, water and carbon dioxide	2HCl (aq) + $CaCO_3$ (s) $\longrightarrow CaCl_2$ (aq) + H_2O (l) + CO_2 (g)
Dissociation of hydrogen chloride in water	HCl (aq) $\rightarrow H^+$ (aq) + Cl^- (aq)
Forming an insoluble salt e.g. lead chloride	$CuCl_2$ (aq) + $Pb(NO_3)_2$ (aq) $\rightarrow Cu(NO_3)_2$ (aq) + $PbCl_2$ (s)
Reversible reaction dehydration and hydration of copper sulphate	$CuSO_4.5H_2O$ (s) $\Leftrightarrow CuSO_4$ (s) + $5H_2O$ (l)
Ammonium chloride reversible reaction	NH_4Cl (s) $\Leftrightarrow$ HCl (g) + NH_3 (g)

Section 5

Carbon burning to make carbon dioxide; this is important because it provides the heat for the reduction.	C (s) + O_2 (g) $\longrightarrow CO_2$ (g)
Carbon dioxide reacting with carbon (at the top of the furnace there is little oxygen) to form carbon monoxide	C (s) + CO_2 (g) $\longrightarrow$ 2CO (g)
Carbon monoxide reduces the iron oxide (this is the main reaction)	Fe_2O_3 (s) + 3CO (g) $\longrightarrow$ 2Fe (s) + $3CO_2$ (g)
Calcium carbonate decomposing	$CaCO_3$ (s) $\longrightarrow$ CaO(s) + CO_2 (g) (waste gas)
Calcium oxide reacting with silicon dioxide to form slag	CaO (s) + SiO_2 (s) $\longrightarrow$ $CaSiO_3$ (s)
Electrolysis of molten aluminium oxide	$2Al_2O_3 \longrightarrow 4Al$ (s) + $3O_2$ (g)
Example of cracking e.g. cracking hexane	$C_6H_{14} \longrightarrow C_6H_6 + 4H_2$
Cracking decane	$C_{10}H_{22} \longrightarrow C_5H_{12} + C_3H_6 + C_2H_4$
Haber process	$3H_2$ (g) + N_2 (g) $\Leftrightarrow 2NH_3$ (g)
Making ammonium sulphate and ammonium nitrate (fertilizers)	$2NH_3 + H_2SO_4 \rightarrow (NH_4)_2SO_4$ NH_3 (g) + HNO_3 (aq) $\longrightarrow NH_4NO_3$ (s)
Burning of sulphur:	S + $O_2 \longrightarrow SO_2$
Roasting/burning sulphur dioxide in	$2SO_2 + O_2$ <=> $2SO_3$

oxygen to make sulphur trioxide	
Dissolving of the sulfur trioxide in concentrated sulphuric acid to form oleum.	$SO_3 + H_2SO_4 \longrightarrow H_2S_2O_7$
Oleum reacts with water to from sulphuric acid.	$H_2S_2O_7 + H_2O \longrightarrow 2H_2SO_4$